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IS 12417 (1988): Suction Apparatus, Pedal Operated [MHD 13: Veterinary Hospital Planning and Surgical Instruments]



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“Knowledge is such a treasure which cannot be stolen”



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*Indian Standard*

**SPECIFICATION FOR  
SUCTION APPARATUS, PEDAL OPERATED**

UDC 615.471

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

## *Indian Standard*

# SPECIFICATION FOR SUCTION APPARATUS, PEDAL OPERATED

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Bureau of Indian Standards on 25 April 1988, after the draft finalized by the Anaesthesia, Resuscitation and Allied Equipment Sectional Committee had been approved by the Consumer Products and medical Instruments Division Council.

**0.2** Several types of suction apparatus are available these days. This standard covers the re-

quirements of pedal operated suction apparatus for use in emergency wards, ambulances and also in cases of power failure. This apparatus is particularly useful in operation theatres where inflammable or explosive gases are likely to be present. This standard covers only the general performance requirements of the pedal operated suction apparatus without giving any design details.

### 1. SCOPE

**1.1** This standard specifies the performance and general requirements of pedal operated suction apparatus for surgical and medical use.

### 2. MATERIALS

**2.1 Metal Parts** — The various components shall be constructed of materials having suitable corrosion resistant properties or of materials having durable surface finish suitable for giving adequate protection against corrosion under conditions of normal use.

**2.2 Rubber Components** — The rubber components shall be made of good quality (natural or synthetic) rubber and shall be capable of ageing in an air-oven for 168 h at  $70 \pm 1^\circ\text{C}$  without showing appreciable stiffening, softening, cracking or other changes in condition.

**2.3 Glass Parts** — The glass parts shall be made of transparent glass not having any pronounced tint. They shall be as free as possible from visual defects and shall be reasonably free from internal strain.

**2.4 Plastics** — The plastics used shall be suitable for the purpose intended.

### 3. CONSTRUCTION AND PERFORMANCE REQUIREMENTS

**3.1 Vacuum Unit** — The vacuum unit shall be of suitable type or design capable of creating vacuum up to the minimum negative pressure of 635 mm of mercury column within 10 strokes of the piston of the pump with a minimum stroke volume of 250 ml, to an altitude of 200 m above sea level.

**3.2 Base** — The base of suction apparatus shall

be made of suitable section and thickness so as to provide stability and sturdiness to the unit. It shall have smooth edges and corners. It shall have rubber supports at the bottom.

**3.3 Handle** — A suitable handle shall be provided to carry the suction apparatus. It shall be convenient to hold.

**3.4 Vacuum Gauge** — The vacuum gauge used in the suction apparatus shall be of the Bourdon tube type conforming to IS : 3624 - 1979\*. The scale markings shall be black on white background. The readings shall be in units of millimetres of mercury column.

**3.4.1** The vacuum gauge shall be mounted on the suction line on patient side of the vacuum control valve. It shall be mounted in such a position that it is easily visible during the use of the apparatus.

**3.5 Suction Bottle and Lid** — There shall be one suction bottle preferably of unbreakable plastic of 1.5 litre capacity. The bottle shall be sufficiently wide-mouthed to facilitate inside cleaning and shall be capable of being sterilized. A suitable mechanism shall be provided for fitting the lid and their connections effectively and quickly to the suction bottle. The lid shall be of the pressing type. The lid and its connection to the suction bottle shall be so designed as to provide a leak-proof assembly, capable of easy removal and of steam sterilization at not less than  $134^\circ\text{C}$ . The inlet and outlet pipes shall be so designed and placed as to reduce the possibility of aspirated fluid or froth passing directly from one to the other. The bottle shall be graduated at 50 ml intervals.

\*Specification for pressure and vacuum gauges (first revision).

**3.6 Overflow Cut-Off Valve** — An overflow cut-off valve shall be provided to prevent the aspirated fluid from entering the suction line between the suction bottle and the pump under all normal conditions of use of the apparatus.

**3.7 Exhaust Outlet** — The exhaust air shall be discharged from the apparatus through an outlet to the outside, but not directly on the floor. The exhaust outlet shall be so designed that the suction tubing cannot be erroneously connected to it.

### 3.8 Tubings and Couplings

**3.8.1** The suction apparatus shall be provided with a minimum of 2 m length of tubing. The tubing shall be of 10 mm inside diameter and minimum 3 mm thickness. It shall conform to Grade 1 Type A of IS : 637 - 1965\*. The tubing may also be made of suitable transparent PVC, if required by the purchaser. The PVC tubing shall be of 10 mm inside diameter and minimum 2.5 mm thickness. The tubing shall be capable of withstanding the lowest absolute pressure attainable with the apparatus without collapsing.

**3.8.1.1** The tubing may have antistatic properties, if so required by the purchaser.

**3.8.2** The apparatus shall be provided with couplings fabricated of brass or steel. The couplings shall be tapered slip type with positive screw lock and shall be leak-proof.

## 4. GENERAL REQUIREMENTS

**4.1** The suction apparatus shall be so designed and constructed that in normal use its performance is reliable.

**4.2** The design of the suction apparatus shall be such as to provide adequate stability. It shall not overturn when placed in the most unfavourable position and an uneven load distribution on an inclined plane at an angle of 10° to the horizontal and shall continue to function satisfactorily.

**4.3** The apparatus shall have adequate mechanical strength and shall be so constructed as to withstand the rough usage which may be expected in normal use.

**4.4** The mass of the suction apparatus shall not exceed 7 kg.

## 5. WORKMANSHIP AND FINISH

**5.1** The suction apparatus shall be free from imperfections which may effect its appearance

\*Specification for rubber tubings for general purposes (revised).

or impair its serviceability. The apparatus shall operate smoothly and perform its functions efficiently.

**5.2** The components made from brass shall be plated chromium over nickel in accordance with service Grade 2 of IS : 4827 - 1983\*.

**5.3** The components made from mild steel or cast iron shall be either plated chromium over nickel in accordance with service Grade 2 of IS : 1068 - 1985† or shall be painted in accordance with the procedure given in 5.3.1 to 5.3.3.

**5.3.1** The components shall be pickled, scrubbed and rinsed to remove grease, rust, scale or any other foreign matter.

**5.3.2** After pickling, all components shall be given phosphate treatment in accordance with IS : 3618 - 1966‡, followed by a coating of suitable primer conforming to IS : 2074 - 1979§ for air drying process and IS : 2075 - 1979|| for stoving process. Filler shall be applied to all surfaces requiring filling.

**5.3.3** Two coats of enamel paint shall then be applied as follows:

- a) Undercoat, and
- b) Finish coat with synthetic stoving enamel conforming to IS : 150 - 1950|| or IS : 151 - 1955\*\*, as desired by the purchaser.

**5.3.3.1** The components shall thereafter be baked suitably in an oven. The resulting finish shall be free from all visible defects and shall satisfy the adhesion test given in 6.

## 6. ADHESION TEST

**6.1** A square with its side measuring 12 to 15 mm shall be marked on a conveniently selected spot on the painted surface. Cross lines, at a spacing of 1 to 1.5 mm between each other shall be inscribed over the marked portion with a pointed instrument. Thereafter, cellulose tape shall be applied over this portion and left for two minutes; after which it shall be jerked free from the painted

\*Specification for electroplated coatings of nickel and chromium on copper and copper alloys (first revision).

†Specification for electroplated coatings of nickel plus chromium and copper plus nickel plus chromium on iron and steel (second revision).

‡Specification for phosphate treatment of iron and steel for protection against corrosion.

§Specification for ready mixed paint, air drying, red oxide-zinc chrome, priming (first revision).

||Specification for ready mixed paint, stoving, red oxide-zinc chrome, priming (first revision).

|||Specification for ready mixed paint, brushing, finishing, stoving, for enamel, colour as required.

\*\*Specification for ready mixed paint, spraying, finishing, stoving, enamel, for general purposes, colour as required (first revision).

surface. If more than 5 percent of the squares are ripped away from the painted surface and are adhering to the cellulose tape, the whole surface of the apparatus shall be repainted and again subjected to this test now at two conveniently selected spots and the item considered passing only if it satisfies the test in both the cases.

## 7. INSTRUCTION MANUAL

**7.1** Each suction apparatus shall be provided with a manual giving necessary instructions and precautions to be taken for its proper use. The instruction manual shall include a list of spare parts supplied with the equipment.

## 8. MARKING

**8.1** The suction apparatus shall be permanently marked at an appropriate place to indicate the following:

- a) The position of 'exhaust outlet',
- b) Any other important precaution regarding the use of the apparatus, and

- c) Name or registered trade-mark of the manufacturer.

**8.1.1** The suction apparatus may also be marked with the Standard Mark.

**NOTE** — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

## 9. PACKING

**9.1** Each suction apparatus, shall be packed individually in a single pack in accordance with prevalent trade practice. The packing shall be compact and shall be done in such a manner as to avoid damage during transit. Suction apparatus may also be packed as agreed to between the purchaser and the supplier.

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\*Sales Office in Calcutta is at 5 Chowringhee Approach, P.O. Princep Street, Calcutta 700072

276800

†Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400097

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